

REMARKS

Claims 1, 3-18, and 20-32 are pending. By this Amendment, claims 10 and 11 are amended. Reconsideration in view of above-outlined amendments and the following remarks is respectfully requested.

Entry of this amendment is appropriate under 37 C.F.R. §1.116 as the amendment: (a) places the application in condition for allowance for the reasons discussed herein; (b) does not raise any new issues that would require further consideration and/or search; (c) does not add any claims without canceling a corresponding number of claims; and (d) places the application in better form for appeal, should an appeal be necessary. The amendment is necessary and was not earlier presented because it is made in response to arguments raised in the final rejection. Entry of this Amendment is thus respectfully submitted.

I. THE DRAWINGS COMPLY WITH 37 CFR 1.83(A)

The drawings were objected to under 37 CFR 1.83(a) because the drawings allegedly do not show every feature of the invention specified in the claims. In particular, the drawings allegedly do not show the subject matter of claims 11 and 12. Applicant respectfully traverses this objection.

Amended claim 11 recites “at least one of the inner half and the outer half comprise at least one ridged section adapted to engage the at least one ribbed portion of the connector.” These claimed features are described in paragraph [00183] and illustrated in Figs. 19 and 30. Claim 12 includes “three ribbed portions” and “three ribbed sections.” Fig. 29 clearly illustrates three ribbed portions 404. Figs. 19 and 30 clearly illustrate three ribbed portions 408.

Applicant respectfully submits that the subject matter of claims 11 and 12 is illustrated in the drawings. Accordingly, the drawings comply with 37 CFR 1.83(a). Reconsideration and withdrawal of the objection are respectfully requested.

II. THE CLAIMS DEFINE PATENTABLE SUBJECT MATTER

Applicant appreciates the allowance of claims 1, 3-9, 18 and 20-32 and the indication of allowable subject matter in claim 12.

Claims 10, 11, 13 and 17 were rejected under 35 USC § 103(a) over US Patent No. 6,149,540 to Johnson et al. (“Johnson”) in view of U.S. Patent No. 4,998,905 to Martin. Claims 14-16 were rejected under 35 USC § 103(a) over Johnson in view of Martin. These rejections are respectfully traversed.

Amended claim 10 is directed to a driven pulley for a continuously variable transmission. The driven pulley includes a shaft adapted for operative connection to an output shaft of the continuously variable transmission. The driven pulley further includes an inner half and an outer half rotatably disposed on the shaft. The inner half having a belt engagement surface associated therewith adapted to engage a first side of a belt. The outer half also having a belt engagement surface associated therewith adapted to engage a second side of the belt. A spring biases the inner half and the outer half together with one another. A connector rotatably couples the inner half with the outer half such that both the inner half and the outer half can transmit torque to the shaft through one of the inner half and the outer half. The connector is disposed between the inner half and the outer half.

Johnson discloses a continuously variable transmission having a driven pulley with an inner half and an outer half. Both the inner half and the outer half of the driven pulley, separately transmit torque to the output shaft. Johnson, however, does not disclose that both the inner and outer half of the driven pulley transmit torque to the output shaft through the same half. Furthermore, Johnson does not disclose a connection between the two halves, as claimed in claim 10. As such, the arrangement of Johnson can't transmit torque through the same half. The first half in Johnson transmits torque through a one-way roller clutch 66. The second half transmits torque by a helix 70. This arrangement presents many problems that have

plagued the prior art. In order to move the moveable sheave 56 on the ramps of the helix 70 towards the stationary sheave 52 by the available torque, which is transmitted by the belt 90 to the moveable sheave 56, the angle of inclination of the ramps 72 and 74 must be set with respect to the available torque. A rather small angle of inclination of the ramps 72 and 74 is required in the arrangement of Johnson, which increases ramp length and results in larger components. Reducing the number of ramps 72 and 74 makes a steeper ramp design possible. This, however, reduces the maximum amount of torque that can be transmitted to the moveable sheave 56 because of increased wear, which results in problems with durability. Furthermore, this arrangement permits relative movement between the sheaves 52 and 56, which can result in significant wear on the belt 90.

The present invention improves the efficiency of the CVT driven pulley, while providing a more compact and durable design without decreasing the maximum transmittable torque. By connecting both halves at the driven pulley by the claimed connector, both halves transmit torque from the belt to the output shaft through the same half. With such an arrangement, the torque available at the moveable half increases considerably because torque is supplied from both the fixed and moveable halves. As a result, the angle of inclination of the ramps can be increased significantly, which results in steeper and shorter ramps so that a more compact design can be achieved that operates with a higher efficiency when compared to the prior art. Furthermore, any rotation between the halves is eliminated. Johnson fails to disclose a driver pulley construction having this linked arrangement.

The Office Action relies on Martin for allegedly teaching the deficiencies in Johnson. Martin discloses an adjustable V-belt pulley, which can be selectively changed from one predetermined effective diameter to another predetermined diameter. Such an adjustable V-belt pulley can be used for simple drive systems, for instance a drive for a fan, where it is necessary to adjust the clearance between the two pulley halves with respect to the wear of the

belt. Martin changes the diameter of the pulley to specific and discrete diameters by rotating the non-operating pulley halves against each other to align the different lugs within the corresponding cavities. Such a pulley cannot be used as a pulley for a continuously variable transmission. The pulley of Martin does not permit lateral movement of one half with respect to another half during operation of the pulley. In Martin, movement occurs when the pulley is not operational. One of ordinary skill in the art would not be motivated to modify Johnson with a pulley taught by Martin. Such a modification would destroy the operation of the CVT disclosed by Johnson because the moveable sheave 56 would no longer be moveable with respect to the stationary sheave 52 during normal operation of the transmission. Furthermore, the moveable sheave 56 could no longer glide on the ramps 72 and 74 of the helix 70.

Accordingly, applicant respectfully submits that the Johnson and Martin combination fails to disclose the subject matter of claim 10. Claims 11-17 depend from claim 10 and are allowable over Johnson and Martin for at least the same reasons. Furthermore, with regard to claim 11, the assertion that Johnson discloses a connector 66 having one ribbed section and the inner half has at least one ridge to engage the rib of the connector is in error. Element 66 in Johnson is a roller clutch 66, which connects one half of the pulley to the output shaft. The roller clutch 66 does not connect the two pulley halves. As such, it cannot be construed as a connector as claimed in claim 11. With regard to claim 13, a spline 16 can not be construed as a toothed wheel. Reconsideration and withdrawal of the rejections based upon Johnson and Martin are respectfully requested.

III. CONCLUSION

Applicant respectfully submits that claims 1, 3-18 and 20-32 define subject matter that is patentable over the prior art cited of record. It is respectfully submitted that the application is in condition for allowance. Should further issues require resolution prior to allowance, the Examiner is requested to telephone applicant's undersigned attorney at the number below.

Respectfully submitted,

PILLSBURY WINTHROP LLP

By: 

Glenn T. Barrett, Reg. No.: 38,705

Tel. No.: (703) 905-2011

Fax No.: (703) 905-2500

gbarrett@pillsburywinthrop.com

GTB

Post Office Box 10500
McLean, VA 22102
(703) 905-2000